Sicyopus (Smilosicyopus) pentecost, a new species of freshwater goby from Vanuatu and New Caledonia (Gobioidei: Sicydiinae)

by

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ABSTRACT. - *Sicyopus* (*Smilosicyopus*) *pentecost* n. sp., a carnivorous freshwater goby, is described on the basis of nine specimens (five males, four females) collected from high gradient streams on the islands of Pentecost (Vanuatu) and Bélep (New Caledonia). This species differs from other species of the subgenus *Smilosicyopus* by a combination of characters that include more upper jaw teeth (21-26), less scales in lateral series (14-29), less scales in zigzag series (11-14), a greater length in second dorsal fin in female, and a shorter caudal peduncle.

RÉSUMÉ. - *Sicyopus* (*Smilosicyopus*) *pentecost,* une nouvelle espèce de gobie d'eau douce du Vanuatu et de Nouvelle-Calédonie (Gobioidei: Sicydiinae).

Sicyopus (*Smilosicyopus*) *pentecost,* n. sp., un gobie carnivore dulçaquicole, est décrite à partir de neuf exemplaires (cinq mâles, quatre femelles) collectés dans les rivières des îles de Pentecost (Vanuatu) et Bélep (Nouvelle-Calédonie). Il diffère des autres espèces du sous-genre *Smilosicyopus* par plusieurs caractères dont un plus grand nombre de dents sur la mâchoire supérieure (21-26), moins d'écailles en ligne latérale (14-29), moins d'écailles en série zigzag (11-14), une seconde nageoire dorsale plus longue chez la femelle, ainsi qu'un pédoncule caudal plus court.

Key words. - Gobiidae - Sicydiinae - *Sicyopus pentecost* - Vanuatu - New Caledonia - Freshwater - New species.

During the past 25 years many freshwater gobies, including those of the subfamily Sicydiinae Gill, 1860, (Gobioidei), have been collected and identified from freshwater streams throughout the tropical Indo-Pacific. Indeed, approximately 50 new species of Sicydiinae have been described from the Pacific region since 1979 (Watson *et al*., 2001).

In 1998, the New Zealand Ministry of Foreign Affairs sponsored the first survey of freshwater environments throughout the islands of Vanuatu (Gerbeaux *et al*., 1998), and between 2002 and 2010, the National Museum of Natural History of Paris (MNHN) conducted numerous surveys of fish occurring in freshwater streams and rivers on the islands of Maewo, Santo, Tanna, Ambae, Efate, Malekula, Gaua, and Pentecost (Keith *et al*., 2004a; Keith *et al*., 2004b; Watson *et al*., 2007; Keith *et al*., 2007). In New Caledonia, between 1998 and 2003, the MNHN conducted, with the provincial and territorial authorities, an exhaustive inventory of freshwater fish. Inventories were undertaken on the major hydrosystems of Grande-Terre and Loyalties Islands (Keith *et al*., 2000; 2002; Watson *et al*., 2001, 2002, 2005; Marquet *et al*., 2003). These inventories were completed between 2004 and 2010 during additional specific studies, particularly in Panié Mountain, Côte oubliée and Bélep Islands (Keith *et al*., 2009). These inventories permitted the discovery of new species.

The purpose of this paper is to provide a description of *Sicyopus* (*Smilosicyopus*) *pentecost* n. sp., a freshwater goby known from Vanuatu and New Caledonia.

Watson (1999) defined three subgenera (*Juxtastiphodon*, *Smilosicyopus* and *Sicyopus*) as belonging to *Sicyopus* Gill, 1863, based largely on dental characteristics found in both jaws. *Juxtastiphodon* has closely set conical teeth in both jaws, none recurved and without canines. *Sicyopus* has widely spaced conical teeth in both jaws with most sharply recurved and without canines. *Smilosicyopus* is with slightly recurved conical teeth anteriorly in both jaws, laterally needle-like teeth with none recurved, between anterior and lateral teeth, at least one (1-3) canine tooth, well developed in males.

The new species belong to the subgenus *Smilosicyopus* which currently includes *Sicyopus* (*Smilosicyopus*) *leprurus* Sakai & Nakamura, 1979; *Sicyopus* (*Smilosicyopus*) *bitaeniatus* Maugé, Marquet & Laboute, 1992; *Sicyopus* (*Smilosicyopus*) *fehlmanni* Parenti & Maciolek, 1993; *Sicyopus* (*Smilosicyopus*) *mystax* Watson & Allen, 1999; *Sicyopus* (*Smilosicyopus*) *chloe* Watson, Keith & Marquet, 2001 and *Sicyopus* (*Smilosicyopus*) *sasali* Keith & Marquet, 2005. *Smilosicyopus* is known from the Andaman Islands (Indian Ocean) to the Marquesas Islands and southern Japan to New Caledonia in swift clear, high gradient streams.

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METHODS

The methods follow Watson (1995) and Keith and Marquet (2005). Measurements were taken with a dial calliper to the nearest tenth of a millimetre. All counts were taken from the right side. The size is given in standard length (SL). Teeth were counted to the right of symphysis. Abbreviations for institutions and collections cited follow Leviton *et al.* (1985), except LICPP, which is now BLIH (Biological Laboratory, Imperial Household, Akasaka Imperial Palace, Tokyo) and CMK (Collection of Maurice Kottelat, Cornol, Switzerland). Abbreviations for the cephalic sensory pore system follow Akihito (1986).

Comparative material. - *Sicyopus* (*Smilosicyopus*) *bitaeniatus* Maugé, Marquet & Laboute, 1992. Marquesas Islands: MNHN 1992-113, female (34.4 mm); MNHN 1992-115, 2 males, 8 females (21.3-33.6 mm); Hiva Oa: Vaioa River, 7 Jan. 1987, G. Marquet coll.; MNHN 1992-114, 2 females, 1 unsexed (26.2-28.8 mm); Ua Pou: Paaumea River, 22 Dec. 1986, G. Marquet coll.; MNHN 2004-1277, 15 spm; Hiva Oa: Vaioa River, 13 Feb. 2000, Keith *et al.* coll.

Sicyopus (*Smilosicyopus*) *fehlmanni* Parenti & Maciolek, 1993. Caroline Islands: CAS-SU 52024, 13 males, 20 females, 1 juvenile (15.4-40.2 mm); Belau: Babelthuap Island, south fork Arakitaoch Stream, 2.2 km southeast of Ngarekeai village, 26 Nov. 1956, Sumang *et al.* coll.; CAS-SU 69693, 16 males, 29 females (18.9-33.4 mm); Ngardmau Municipality: north fork Amekaud River, 10 Oct. 1957, Sumang *et al.* coll.

Sicyopus (*Smilosicyopus*) *leprurus* Sakai & Nakamura, 1979. Japan: Ryukyu Islands, BLIH 1983170, 5 males, 1 female (31.9-41.4 mm); Okinawa Prefecture, Ishigaki Island, Ishigaki City: Ara River, 10 Jul. 1983; BLIH 1986407, male (30.5 mm); Ishigaki City: Ara River, 9 Sept. 1986; BLIH 1987587, female (31.8 mm);Ishigaki City: Ara River, 10 Oct. 1987; BLIH 1989135, male (29.5 mm), BLIH 1989136, female (33.2 mm); Ishigaki City: Ara River, 17 Oct. 1989; BLIH 1990727, female (30.1 mm); Ishigaki

Table I. - Number of upper jaw teeth in *Sicyopus pentecost* and related species.

	Upper jaw teeth														
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
S. pentecost males										2	-	1	1		
S. pentecost females											2	-	1	-	1
S. sasali males							1	-	2						
S. sasali females				1	-	-	2	-	1						
S. chloe males				1	1	2	1	-	-	1	2				
S. chloe females		1	4	1	3	4	1								
S. bitaeniatus males						1	-	-	-	-	1				
S. bitaeniatus females					3	1	1	3	1	2	1				
S. fehlmanni males		1	4	2	8	4	2	5	3	1					
S. fehlmanni females	1	5	8	11	12	5	7	2	4						
S. leprurus males		2	2	4	1	-	1								
S. leprurus females	1	-	1	-	3	2									

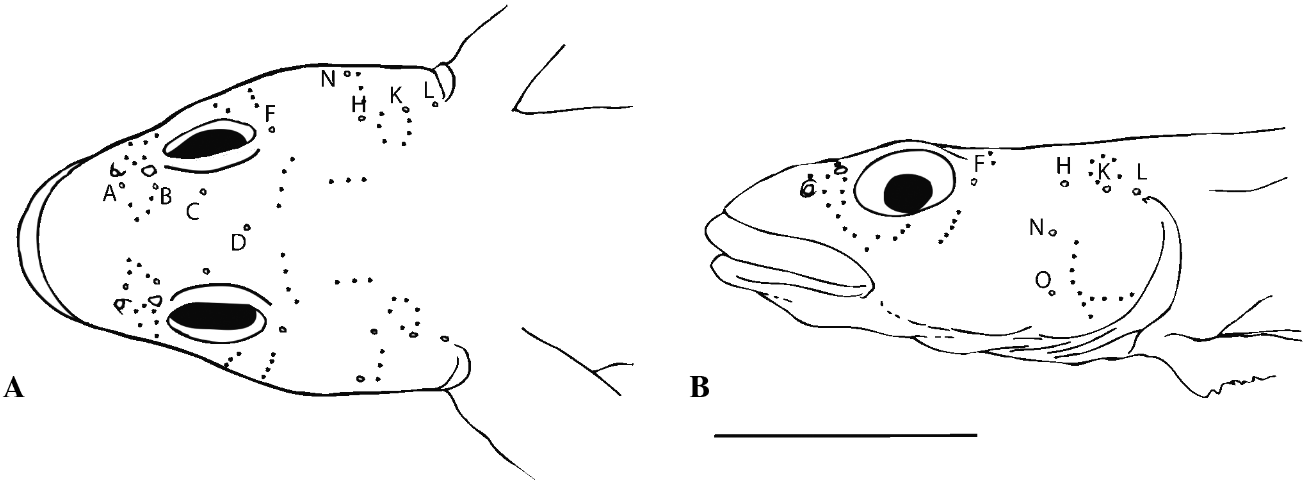

Figure 1. - Diagrammatic illustration of the head of *Sicyopus pentecost* (MNHN 2010-0050) showing head pores and sensory papillae. **A**: Dorsal view; **B**: Lateral view. Scale bar = 5 mm.

City: Ara River, 6 Oct. 1990; NSMT P.28619, 2 males, 2 females; Ishigaki Island: Arakawa River, 2 Sept. 1974; URM P4529, female (30.1 mm), 4 Sept. 1982.

Sicyopus (*Smilosicyopus*) *chloe* Watson, Keith & Marquet, 2001. New Caledonia: MNHN 1996-262, male (33.9 mm); Wé Tite River, 23 Sept. 1991, PEDCAL coll.; BPBM 37406, female (32.4 mm); Cascade de Tao, 9 Oct. 1996, G. Marquet coll.; MNHN 1996-263, male (31.6 mm); Wé Tite River, 23 Sept. 1991, PEDCAL coll.; MNHN 2000-670, 2 females (25.9-34.3 mm), Tao Waterfall; 3 Apr. 1999, Chloé I Expedition; SMF 28325, 2 females (26.8-32.3 mm); Tao Waterfall, 14 Dec. 1996, G. Marquet coll.; MNHN 2000-671, male (40.4 mm); Kokengoné River, 28 Oct. 1999, Chloé II Expedition; MNHN 2000-672, 3 males, 3 females (24.0-27.9 mm); Tibarama River, station 3, 26 Oct. 1999, Chloé II Expedition; MNHN 2000-673, female (21.2 mm); Narûma River, 26 Oct. 1999, Chloé II Expedition; MNHN 2000-674, 1 male, 4 females (23.1-42.5 mm); tributary of Napoémien River, north of Napwéimiê near Poindimié, 28 Oct. 1999, Chloé II Expedition; UF 112009, 1 male, 1 female (31.4-33.1 mm); tributary of Napoémien River, north of Napwéimiê near Poindimié, 4 Apr. 1999, Chloé I Expedition.

Sicyopus (*Smilosicyopus*) *mystax*, Watson & Allen, 1999. Indonesia: MZB 9221, male (33 mm); Irian Jaya, Aiyindor River, 12 Jan. 1997, Allen coll.; WAM P.31262-004, 2 males, 2 females (30.4-40.4 mm).

Sicyopus (*Smilosicyopus*) *sasali*, Keith & Marquet (2005). Futuna: MNHN 2004-3170 (Holotype), male; Vanifao River, 15 Oct. 2004, Keith, Marquet, Sasal, Labrousse coll.; MNHN 2004-3171 (Paratypes), 2 males, 5 females (26.41-43.51 mm); same data as holotype.

S. mystax differs from all other *Sicyopus* (*Smilosicyopus*) including *S. pentecost* in having 14 pectoral rays *versus* 15, and in having no sexual dimorphism in jaw length; it is not included in tables I-IV.

SICYOPUS (SMILOSICYOPUS) PENTECOST, N. SP.

(Figs 1-2, Tabs I-IV)

Material examined

Nine specimens from Pentecost island (Vanuatu) and Bélep (New Caledonia), totalling five males, four females; size range 32-44 mm SL (47.7-51.4 mm, total length (TL)), largest male, 44.0 mm SL, largest female, 43.4 mm SL.

Holotype. - MNHN 2010-0049, male (42 mm SL),

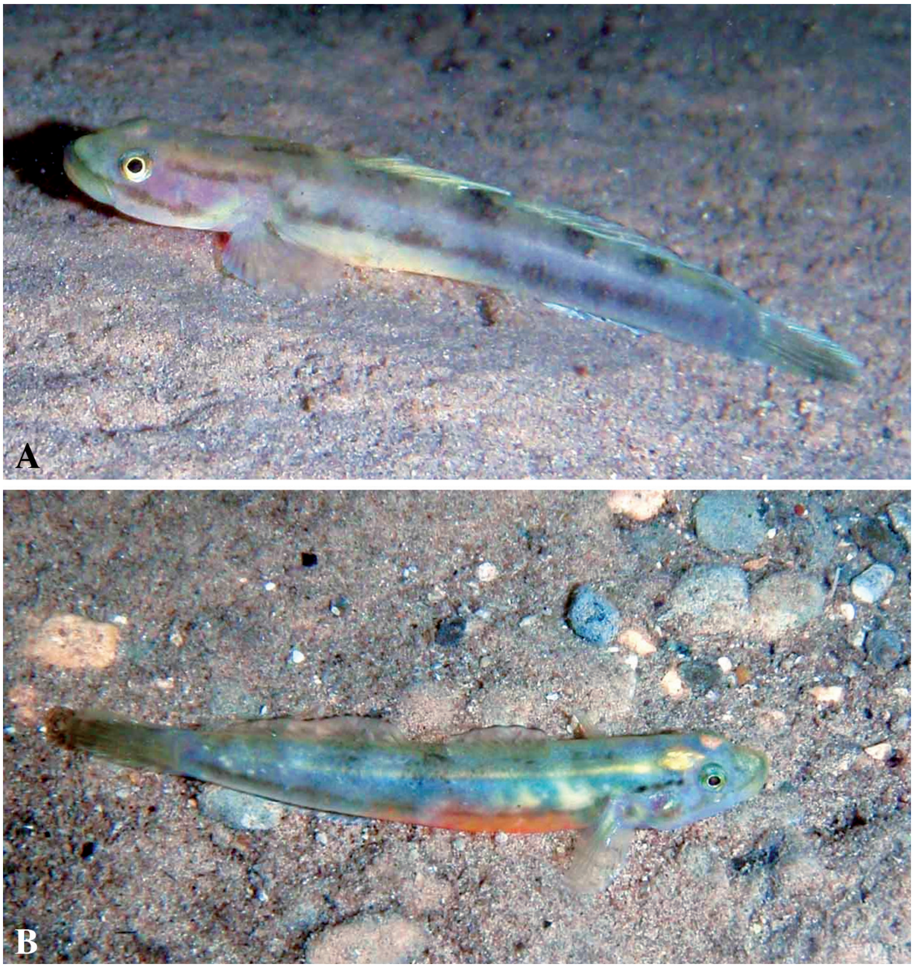

Figure 2. - *Sicyopus pentecost*. **A**: Male *in vivo* (paratype, MNHN 2010-0050) (photo: C. Lord); **B**: Mature female *in vivo* (paratype, MNHN 2010-0050) (photo: P. Keith).

Silengwasu River, 80 meters high, 25 Jan. 2010, Keith, Taillebois, Lord, Kalfatak, Feutry coll.

Paratypes. - MNHN 2010-0050, 3 males, 4 females, size range 32-44 mm SL; same data as holotype.

The specimen from Bélep Island has been released. A piece of fin has been preserved for genetic purposes.

Diagnosis

A *Sicyopus (Smilosicyopus)* species which is distinguished from the other species with the following set of characters: 15 pectoral rays; numerous upper jaw teeth in male and female (21-26), less scales in lateral series (14-29) and zigzag series (11-14); a long second dorsal fin in females; a short caudal peduncle. Head blackish dorsally with a blackish band extending from the tip of snout and upper lip, under the eye to the posterior edge of operculum and pectoral base. A blackish band extending from the back of the eye to the dorsal part of pectoral fin base and to caudal fin along body midline.

Description

Scale counts in *S. pentecost* and related species are given in table II, number of upper jaw teeth in table I, morphometrics in table III and fin length in table IV. Below, the holotype counts are given first, followed, in brackets, by the paratypes' counts.

Dorsal fins D VI-I, 9, spines 5-6 slightly filamentous in males and not in females, first dorsal fin not contacting second dorsal fin basally. Anal fin I,10 (I,9 (1), I,10 (6)). Pectoral fin rays 15, posterior margin rounded in female, pointed in male. Caudal fin 13 (13 (6), 14 (1)) branched rays, posterior margin rounded. Pelvic disc with 1 spine and 5 strongly branched rays, disc adherent to abdomen between fifth rays only. Scales in lateral series 25 (14-29) (Tab. II), may extend midlaterally over the origin of second dorsal fin and posteriorly to hypural base; scales usually cycloid. Scales along dorsum usually extend anteriorly along medial base of second dorsal fin (may extend to base of first dorsal fin). Scales in zigzag series 11 (11-14), transverse back series 4 (0-4), transverse forward series 3 (0-4) (Tab. II). Predorsal midline naked. Head, breast, belly and pectoral base, usually naked. Upper jaw teeth mostly conical (range 21-26) with 4 or 8 canines present laterally; no difference between male and female. Lower jaw teeth conical (range 12-15), with 1-2 canine teeth usually present laterally (Tab. I). Cephalic sensory pore system A, B, C, D, F, H, K, L, N and O, D singular, with all others paired, oculoscapular canal separated into anterior and posterior canals between pores H and K (Fig. 1). Cutaneous sensory papillae developed on the head. Urogenital papilla in male long and thin with a fairly pointed to rounded tip. Urogenital papilla in female with two lobes.

Colour in preservation

Sexual dichromatism not well developed.

Males. - Background of head and body greyish. Body greyish dorsal to midline, yellowish midline to ventral, caudal peduncle blackish. Head blackish dorsally with a blackish band extending from the tip of snout and upper lip, under the eye to the posterior edge of operculum and pectoral base. Head whitish under this band and ventrally. Blackish horizontal band under the mouth in the anterior part of head. Snout blackish. Nape greyish. Faint and thin blackish band extending from pectoral base to caudal fin along body midline. First and second dorsal fin hyaline, with black distal margin and a blackish medial band; dorsal fin spines highlighted by black pigments. Caudal fin dusky to greyish. Anal fin dusky to hyaline with black distal margin. Pelvic disc entirely white. Pectoral fin dusky becoming whitish dorsally and ventrally. Pectoral base blackish medially, slightly dusky ventrally and dorsally. Mature males can bear several blackish saddle-like lateral bands on the back from the second dorsal fin to the caudal peduncle.

Females. - Background of head and body greyish. Body dusky with blackish saddle-like lateral bands evenly spaced from the second dorsal fin to the caudal peduncle. Belly orange to red in gravid females. Head blackish dorsally with a blackish band extending from the tip of snout and upper lip, under the eye to the posterior edge of operculum and pectoral base. Head whitish under this band and ventrally. Blackish horizontal band under the mouth in the anterior part of the head. Snout blackish. Nape greyish with a short blackish band anterior to first dorsal fin and a blackish band extending from the back of the eye to the dorsal part of pectoral fin base. Blackish band extending from pectoral base to caudal fin along body midline. First and second dorsal fins hyaline, with black distal margin and a blackish medial band; dorsal fin spines highlighted by black pigments. Caudal fin dusky to greyish with slight blackish exterior margin. Anal fin dusky to hyaline with black distal margin. Pelvic disc entirely white. Pectoral fin dusky becoming whitish dorsally and ventrally. Pectoral base blackish medially, slightly dusky ventrally and dorsally.

Colour in life

Body dusky to slightly yellowish. Cheeks light orange to pinkish. Five to six saddle-like lateral bands present evenly spaced from the back of the nape to the caudal peduncle. Head blackish dorsally with a blackish band extending from the tip of snout and upper lip, under the eye to the posterior edge of operculum and pectoral base. Blackish band extending from the back of the eye to the dorsal part of pectoral fin base. Blackish band extending from pectoral base to caudal fin along body midline. Dorsal and anal fins dusky to hyaline with a black distal margin. Caudal fin greyish. Pectoral fins hyaline.

Males (Fig. 2A). - Caudal and anal fins dusky with whitish to bluish distal margin. Belly whitish to orange.

Females (Fig. 2B). - Caudal fin blackish near caudal

Table II. - Scale counts in *Sicyopus pentecost* and related species.

	Lateral series																																			
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
S. pentecost			1	-	-	-	-	1	-	1	-	1	1	2	-	-	-	1																		
S. sasali													1	1	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
S. chloe	1	-	1	1	2	2	2	3	-	3	-	-	-	-	1	-	1	1	-	1	-	-	-	-	-	1										
S. bitaeniatus																			1	2	1	-	1	-	2	1	2	1	-	1	-	-	-	-	1	
S. fehlmanni			9	5	4	8	8	6	4	6	6	4	8	4	-	-	1	2	1	1	-	1														
S. leprurus					1	2	2	1	-	1	5	1	-	-	-	-	1	-	-	1	-	-	-	1												

	Transverse series back																						
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S. pentecost	2	2	-	1	3																		
S. sasali				1	-	-	-	-	1	-	-	3	-	2									
S. chloe	20	-	1	1																			
S. bitaeniatus	15			2			1																
S. fehlmanni	49	-	1	7	2	3	2	-	1	1	4	1	2	1	1	-	1	1	-	-	1	1	1
S. leprurus	16	-	-	-	-	-	1																

	Zigzag series												
	9	10	11	12	13	14	15	16	17	18	19	20	21
S. pentecost			4	1	2	1							
S. sasali			1	4	-	2							
S. chloe				1	2	6	3	6	2				
S. bitaeniatus								2	6	1	3	-	1
S. fehlmanni	2	15	16	26	12	8							
S. leprurus		1	1	2	3	6	3						

	Transverse series forward													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13
S. pentecost	2	-	2	3	1									
S. sasali	2	-	-	1	-	2	-	-	1	-	-	-	-	1
S. chloe	21	-	-	1										
S. bitaeniatus	14		1	2										
S. fehlmanni	64	3	3	3	2	4								
S. leprurus	16	-	-	-	-	-	-	-	1					

peduncle. Belly bright orange or rose in gravid female.

Distribution

Known from streams of Pentecost Island (Vanuatu) above 80 m high and Bélep archipelago on Art Island (New Caledonia) above 70 m high (Paraweli River-Gaawé la Madar).

Affinities

S. pentecost differs from all other *Sicyopus* (*Smilosicyopus*) in having more upper jaw teeth (21-26 *versus* 12-22), and from all other but *S. sasali* and *S. bitaeniatus* in having a longer second dorsal fin (32-34 *versus* 22-32). Moreover, it differs from *S. chloe* in having less scales in zigzag series (11-14 *versus* 12-17), and a black band on the middle of nape *versus* usually seven blackish spots on each side of nape. *Sicyopus pentecost* differs from *S. sasali* in having less scales in lateral series (14-29 *versus* 24-47) and transverse back series (0-4 *versus* 3-13). *Sicyopus pentecost* differs from *S. bitaeniatus* in having less scales in lateral series (14-29 *versus* 30-46) and less scales in zigzag series (11-14 *versus* 16-21). *Sicyopus pentecost* differs from *S. leprurus* in having mostly more scales in transverse back series (0-4 *versus* 0) and in transverse forward series (0-4 *versus* 0). *Sicyopus pentecost* differs from *S. fehlmanni* in having less scales in transverse back series (0-4 *versus* 0-22).

Ecology

Like other Sicydiinae (see Keith, 2003), *Sicyopus pentecost* is found in clear, high gradient streams with rocky bottom. It lives on the bottom of the river, on top of rocks but it is also often seen swimming in open water in the current between rocks or in large pools. This new species is supposed, like the other *Sicyopus*, to spawn in freshwater; the free embryos drift downstream to the sea where they undergo a planktonic phase, before returning to the rivers to grow and reproduce (Keith *et al.*, 2008; Iida *et al.*, 2010), hence they are called

Table III. - Morphometrics in *Sicyopus pentecost* and related species expressed to the nearest whole percent of standard length.

	Predorsal length									
	33	34	35	36	37	38	39	40	41	42
S. pentecost				2	1	1	2	2		
S. sasali			1	-	2	2	1	1	1	
S. chloe			2	3	9	2	5	-	1	
S. bitaeniatus				4	-	3	3	4		
S. fehlmanni			4	8	19	27	12	4	3	1
S. leprurus	1	-	2	1	11	2				

	Preanal length											
	54	55	56	57	58	59	60	61	62	63	64	65
S. pentecost males						3	-	1				
S. pentecost females			1	-	1	2						
S. sasali males			1	-	-	2						
S. sasali females				1	-	1	1	-	2			
S. chloe males						1	2	5				
S. chloe females						1	2	4	2	3	2	
S. bitaeniatus males					1	-	-	-	1			
S. bitaeniatus females					1	-	-	2	4	2	2	1
S. fehlmanni males		1	-	4	4	11	5	4				
S. fehlmanni females	1	-	-	2	1	8	6	13	15	2	1	

	Jaw length					
	7	8	9	10	11	12
S. pentecost males			1	3		
S. pentecost females		1	1	1	1	
S. sasali males				1	2	
S. sasali females	1	2	2			
S. chloe males				4	2	2
S. chloe females	6	5	3			
S. bitaeniatus males				2		
S. bitaeniatus females	1	3	4	4		
S. fehlmanni males		8	19	2	1	
S. fehlmanni females	13	31	6			
S. leprurus males		1	2	1	2	4
S. leprurus females	5	2				

	Head length						
	22	23	24	25	26	27	28
S. pentecost			2	2	1	2	1
S. sasali			1	3	3	1	
S. chloe		5	7	8	1	1	
S. bitaeniatus	1	1	5	1	4	1	1
S. fehlmanni	1	17	21	26	12	1	
S. leprurus	1	3	5	4	3	1	

	Caudal peduncle length											
	12	13	14	15	16	17	18	19	20	21	22	23
S. pentecost	1	1	5	1								
S. sasali	1	2	-	2	2	-	1					
S. chloe					1	1	2	3	11	2	2	
S. bitaeniatus					1	5	6	-	1	-	1	
S. fehlmanni						4	10	28	24	12	1	1
S. leprurus						1	4	6	5	1		

	Caudal peduncle depth				
	7	8	9	10	11
S. pentecost				5	3
S. sasali		1	3	2	2
S. chloe		2	11	9	
S. bitaeniatus	1	3	10		
S. fehlmanni	4	19	39	17	
S. leprurus			10	7	

	Body depth at second dorsal fin origin in males						
	9	10	11	12	13	14	15
S. pentecost				1	1	1	1
S. sasali		1	-	-	-	2	
S. chloe		2	2	4			
S. bitaeniatus			1	1			
S. fehlmanni	2	12	11	5			
S. leprurus	1	3	5	1			

amphidromous (Keith *et al.* 2006; McDowall 2007; Lord *et al*., 2010). On islands, the impact of humans on aquatic habitats is highly significant, particularly on estuarine habitats, which are crucial to amphidromous species (Murphy and Cowan, 2007; Lord and Keith, 2008). These have to undertake two migrations between freshwater and the sea. The success of such a life cycle – i.e., production of larvae for downstream migration after hatching and restocking rivers with post-larval and juvenile upstream colonisation after recruitment in freshwaters – depends on maintaining the mountain-ocean corridor open to allow movements between both habitats (Radtke *et al*., 2001). Man-made developments on these streams can alter larval dispersion and therefore the recruitment success (Keith and Marion, 2002; Valade *et al*., 2009). It is therefore necessary to understand its biology to the best of our ability, and to develop regional management and restoration strategies between New Caledonia and Vanuatu in order to preserve amphidromous gobies.

Etymology

The new species is named for Pentecost island (Vanuatu), type locality, and is defined as a noun in apposition.

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Table IV. - Fin lengths in *Sicyopus pentecost* and related species expressed to the nearest whole percent of standard length

	Second dorsal fin length																																
	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
S. pentecost males															1	-	-	-	-	-	2	1											
S. pentecost females											2	1	1																				
S. sasali males																	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
S. sasali females		1	-	-	-	-	-	2	-	-	-	-	1	1																			
S. chloe males												1	3	1	-	1	1	-	1														
S. chloe females						2	5	2	1	3	1																						
S. bitaeniatus males												1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1		
S. bitaeniatus females						2	3	-	3	-	-	3	-	1	1																		
S. fehlmanni males										1	1	1	3	3	4	4	2	5	2	1	1	-	1	-	1								
S. fehlmanni females	1	-	-	1	4	12	7	9	8	4	4																						
S. leprurus males										1	-	-	-	-	-	-	1	-	3	1	1	1	1	-	1								
S. leprurus females						1	1	-	1	3	1																						

	Anal fin length															
	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
S. pentecost males							1	2	1							
S. pentecost females						1	2	1								
S. sasali males											1	-	2			
S. sasali females	1	-	1	-	-	-	-	1	1	1						
S. chloe males								2	1	2	1	1	1			
S. chloe females			1	-	3	3	6	1								
S. bitaeniatus males					1	-	-	1								
S. bitaeniatus females	2	1	2	1	3	2	1									
S. fehlmanni males						1	2	3	10	7	3	3	-	1	-	1
S. fehlmanni females		1	-	3	21	19	6	1								
S. leprurus males					1	-	-	-	2	3	1	3				
S. leprurus females				4	2	1										

	Caudal fin length									
	16	17	18	19	20	21	22	23	24	25
S. pentecost males					1	3				
S. pentecost females				1	1	1	1			
S. sasali males						1	-	1	1	
S. sasali females	1	-	2	-	-	-	2			
S. chloe males					4	1	1	1		
S. chloe females		1	-	1	4	6	2			
S. bitaeniatus males							1	1		
S. bitaeniatus females		1	-	-	2	-	8	-	1	
S. fehlmanni males			1	1	13	5	7	3		
S. fehlmanni females	1	-	3	6	19	12	4	5		
S. leprurus males					4	2	-	3	-	1
S. leprurus females				1	4	1	-	1		

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